

WE CLAIM:

1. An isolated recombinant polynucleotide that comprises a nucleotide sequence encoding a disorazole polyketide synthase (PKS) protein or a fragment comprising at least one domain of said PKS.
2. The polynucleotide of claim 1, wherein said polynucleotide hybridizes under stringent hybridization conditions to a polynucleotide having the sequence of the SEQ ID NO:1 or its complement.
3. The polynucleotide of claim 1 that comprises a sequence encoding a disorazole polyketide synthase polypeptide selected from the group consisting of DszA, DszB, DszC, and DszD.
4. The polynucleotide of claim 1, wherein said domain is selected from the group consisting of an AT domain, a KS domain, an ACP domain, a KR domain, a DH domain, and an ER domain.
5. The polynucleotide of claim 1 that comprises a sequence encoding a disorazole polyketide synthase module selected from the group consisting of module 1, 2, 3, 4a, 4b, 5, 6, 7, or 8.
6. A vector that comprises a polynucleotide of claim 1.
7. The vector of claim 6 that is an expression vector.
8. A recombinant host cell comprising the vector of claim 7.
9. A recombinant host cell comprising a polynucleotide of claim 1 integrated into the cell chromosomal DNA.

10. A method of producing a polyketide, which method comprises growing the recombinant host cell of claim 8 under conditions whereby a polyketide synthesized by a PKS comprising a protein encoded by said polynucleotide molecule is produced in the cell.
11. A chimeric PKS that comprises at least one domain of a disorazole PKS.
12. A cell comprising the chimeric PKS of claim 11.
13. A modified functional disorazole PKS that differs from the native disorazole PKS by the inactivation of at least one domain of the disorazole PKS and/or addition of at least one domain of a non-disorazole PKS.
14. A cell comprising the PKS of claim 13.
15. A recombinant expression system capable of producing a disorazole synthase domain in a host cell, said system comprising an encoding sequence for a disorazole polyketide synthase domain, and said encoding sequence being operably linked to control sequences effective in said cell to produce RNA that is translated into said domain.
16. A host cell modified to contain a recombinant expression system of claim 15.
17. A recombinant *Sorangium cellulosum* cell in which a *dszA*, *dszB*, *dszC*, or *dszD* gene is disrupted so as to reduce or eliminate production of disorazole.
18. An isolated polypeptide encoded by a recombinant polynucleotide of claim 1.
19. A hybrid polyketide synthase comprising one or more polypeptides of a disorazole PKS and one or more polypeptides of a nondisorazole PKS .

20. A recombinant DNA molecule, comprising a sequence of at least about 200 basepairs with a sequence identical or substantially identical to a protein encoding region of SEQ ID NO:1.